EMPLOYMENT OF ATTACK AND RECONNAISSANCE HELICOPTERS

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

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B.S., The Citadel, Charleston, South Carolina, 1992

Fort Leavenworth, Kansas
2005

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
17-06-2005	Master's Thesis	Aug 2004 - Jun 2005

4. TITLE AND SUBTITLE

Employment of Attack and Reconnaissance Helicopters

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

MAJ Chad H. Smith

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
1 Reynolds Ave.
Ft. Leavenworth, KS 66027-1352

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Attack and reconnaissance helicopters must continue to be a force multiplier for future ground maneuver commanders. The problem is that attack and reconnaissance pilots have lost the skills of performing close combat attack and air-ground integration. Missions conducted in Operation Iraqi Freedom and Operation Enduring Freedom proved that attack and reconnaissance pilots were not trained on these tasks. For over twenty years, senior Army aviation commanders concentrated their training efforts for attack pilots on mainly performing deep attack helicopter operations. Additionally, reconnaissance pilots lost the skill of maneuvering with attack helicopters. Multiple asymmetrical threats in the contemporary operating environment will continue to create challenges for Army Aviation. Therefore, helicopter pilot training at the individual level through the unit level must incorporate lessons learned from combat. Deep helicopter attacks should not be removed from attack pilot training. However, additional emphasis should be placed on attack and reconnaissance helicopter pilots maneuvering in close combat support of the ground maneuver commander.

15. SUBJECT TERMS

Attack and Reconnaissance Helicopter, Attack and Reconnaissance Pilots, force multiplier, ground maneuver commanders, Army aviation, helicopter pilot training

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. TELEPHONE NUMBER** *(include area code)*
Unclassified	Unclassified	Unclassified	UU	79	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

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ABSTRACT

EMPLOYMENT OF ATTACK AND RECONNAISSANCE HELICOPTERS, by MAJ Chad H. Smith, 71 pages.

Attack and reconnaissance helicopters must continue to be a force multiplier for future ground maneuver commanders. The problem is that attack and reconnaissance pilots have lost the skills of performing close combat attack and air-ground integration. Missions conducted in Operation Iraqi Freedom and Operation Enduring Freedom proved that attack and reconnaissance pilots were not trained on these tasks. For over twenty years, senior Army Aviation Commanders concentrated their training efforts for attack pilots on mainly performing deep attack helicopter operations. Additionally, reconnaissance pilots lost the skill of maneuvering with attack helicopters. Multiple asymmetrical threats in the contemporary operating environment will continue to create challenges for Army Aviation. Therefore, helicopter pilot training at the individual level through the unit level must incorporate lessons learned from combat. Deep helicopter attacks should not be removed from attack pilot training. However, additional emphasis should be placed on attack and reconnaissance helicopter pilots maneuvering in close combat support of the ground maneuver commander.

ACKNOWLEDGMENTS

I would first like to thank the good Lord for giving me the strength and persistence to complete this journey. Also, without the help of my committee, this thesis would have not been written. My small group advisor, LTC Debra Roesler, was a tremendous help in providing advice while keeping me organized. LTC Roesler's patience kept me focused. Finally, Ms. Helen Davis of the Command and General Staff College Master of Military Art and Science Office, was extremely helpful. Without her help, I would have not completed this thesis.

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ACRONYMS

AAR	After-Action Reports
BDA	Battle Damage Assessment
ECC	Effects Coordination Cell
ETAC	Enlisted Tactical Air Controller
FARP	Forward Area Refueling Point
FLIR	Forward-Looking Infrared
HUMINT	Human Intelligence
IED	Improvised Explosive Device
JRTC	Joint Readiness Training Center
JSTARS	Joint Surveillance Target Attack Radar System
MMS	Mast-Mounted Site
NTC	National Training Center
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
RPG	Rocket-Propelled Grenade
SEAD	Suppression of Enemy Air Defense
TIS	Thermal Imaginary Sight
TTPs	Tactics, Techniques, and Procedures

CHAPTER 1

INTRODUCTION

Introduction

> July 1963--Quick reaction time, along with flexibility and firepower, paved great dividends, when the Utility Tactical Transport Helicopter Company (UTT) answered urgent pleas from two Ranger Battalions ambushed by the Viet Cong. In minutes the helicopters arrived spreading fear, pain, and death among the Viet Cong (VC), which caused them to withdraw. The ambushes could have easily been a Little Big Horn in the vicinity of Phouc Binh for one of the Ranger Battalions. (1964, 25)
>
> Major Calvin R. Bean, *UTT Helicopter Company in Vietnam from October 1962–January 1964*

The effectiveness of today's commander is measured against his ability to combat the asymmetrical and linear threats. In order to combat these threats effectively, Army aviators must be doctrinally trained in the employment of attack and reconnaissance helicopters. Army aviators must also be trained at tasks and missions, which support the ground maneuver commander. Modern attack and reconnaissance helicopters provide the ground maneuver commander with the ability to exploit an enemy in a more diverse role. Once the Apache and Kiowa Warrior emerge, the lethality of properly performing air-ground integration reached a higher level. Air-ground integration gives the commander another option to combat the enemy. From Vietnam until the emergence of the Apache, Army aviators perfected the technique of air-ground integration. During this time aviators were trained in all tasks that involved air-ground integration. However, after the arrival of the Apache, the concept began to change. The Apache was capable of fighting at night, of engaging targets at extended ranges, and of flying longer distances. After the Apache arrived, senior aviation commanders became interested in attack helicopter operations

within the Effects Coordination Cell (ECC) and started to ignore the importance of air-ground integration. Senior commanders within Army aviation created the idea of sending Apache helicopters deep. This concept was designed in order to give a corps commander the ability to combat the Soviet artillery and armor threats. The entire Army leadership quickly absorbed this idea. As a result of the positive visibility of deep operations, the concept grew. Division commanders begin training and performing deep operations. The major shortfall to division commanders using this training approach was their limited ability to visualize the enemy at this distance. Divisional assets could not even see the distance required to conduct deep operations. Therefore, shortly after the emergence of the Apache, almost all AH-64A attack pilots were being trained on flying deep and engaging enemy vehicles far ahead of friendly lines. For over twenty years Army aviation created attack and reconnaissance pilots who did not know how to properly perform air-ground integration. As a result of the lack of air-ground integration training, many of the flying techniques that emerged from the Vietnam War were lost.

Not only did the flying techniques change, the technology also changed Army aviation. The lethality of modern attack and reconnaissance helicopters provides the ground maneuver commander with more flexibility and freedom of maneuver. Army Aviation Doctrine must be written so commanders have guidance to employ attack and reconnaissance helicopters in the close fight. Ground maneuver commanders must also be trained on properly using attack and reconnaissance helicopter assets. There is a greater advantage of employing attack and reconnaissance helicopters in the close fight versus the deep fight. Employment in the close fight permits helicopters and friendly armored tanks to minimize each other's vulnerabilities. The combat power generated by one or

two Apache helicopters is a tremendous weapon in support of the ground maneuver commander's mission. Ground maneuver commanders can use this mobile fire support to help isolate and destroy the enemy. In defensive operations, Apaches can be used against the enemy's reserve to destroy a counter attack. Also, working in support of the ground maneuver commander gives the pilots an instantaneous pick up plan in case their aircraft gets shot down from enemy fire. With friendly vehicles in the area of operation, attack and reconnaissance pilots will be more likely to focus on their mission. Additionally, they will be less worried about whom and when will pick them up in case they cannot independently return from the operation.

In addition to the fire support that Apaches bring to the fight, a pair of Kiowa Warrior helicopters provides instantaneous intelligence to the ground maneuver commander. Their night-seeing capability is arguably the best in the military. Kiowa Warriors can destroy enemy targets of all types with their sensor-to-shooter capability with the field artillery. They are small-sized helicopters and can hide behind most terrain features. Assuming clear weather conditions, modern technology has allowed Army helicopters to fight in both the day and the night. Flying at night maximizes their survivability. Army aviators learn how to perform all flying tasks in the dark. While Apache pilots are able to fly AH-64s in the dark using their forward-looking infrared (FLIR), Kiowa Warriors use both a set of night vision goggles and the mast-mounted site (MMS). The MMS can pick up targets in the dark using thermal imagery or in the daylight using a powerful magnifying lens.

The Research Question

This thesis will analyze the results of properly performing air-ground integration training, research the importance of proper aviation planning in support of the ground commander's mission, and discuss aviation training needed in order to combat the asymmetrical and linear threats. While air-ground training is analyzed, the missions that require the employment of the AH-64A, AH-64D, and the OH-58D helicopters will be defined. Also, the capabilities and limitations of the latest models of Army aviation's attack and reconnaissance helicopters will be defined. Finally, aviation training will be discussed.

Background of the Problem and the Research Question

With the fielding of the AH-64A (Apache) and modern reconnaissance helicopters, a question that continuously arises in debate is, How and when does the ground maneuver commander deploy his attack and reconnaissance helicopters? Since the Apache could fly faster and longer, while carrying more ammunition than any other attack aircraft in history, missions of increased risk were designed for the Apache. Over the last twenty years, senior aviation commanders have created an idea of using the Apache in "deep operations" to destroy tanks and other armored vehicles. Deep operation missions are drastically different from the missions that were intended for the Apache.

Until recently in Iraq, attack pilots were mostly trained to fly twenty to forty kilometers beyond friendly positions. Their task was to attack enemy positions and vehicles without the support of the ground maneuver commander. To aid the attack pilots in these types of missions was close air support, field artillery (mainly rocket fire due to the distance), and satellites. These missions would be conducted far inside enemy

territory for the purpose of conducting shaping operations for the ground maneuver commander. The intended purpose behind shaping operations was to shape the battlefield, which would allow the ground maneuver command to concentrate his forces on a certain avenue of approach. The goal of deep operations was to engage the enemy at further distances in order to reduce direct fire engagements. However, attack and reconnaissance pilots were at high risk without having friendly ground support in the area of the attack. If for any reason the pilot had to land the helicopter or the helicopter was shot down, then there was no proven concept to recover the pilots. The lack of a proven recovery plan is enough to reject the concept of deep operations. This employment technique has resulted in numerous attack and reconnaissance helicopters being shot down in war fighter exercises and most recently in Iraq.

In order to help answer the employment question, a thorough knowledge or understanding of potential threats to helicopters, which includes both asymmetrical and linear is required. Linear threats are doctrinally known as enemy equipment and their employment. Asymmetrical threats include all potential threats with atypical techniques against helicopters. Employment tactics against linear and asymmetrical threats proven by helicopter pilots in Vietnam are arguably still valid today. During Vietnam after the arrival of attack helicopters, the United States Army's opponent developed shoulder-fired heat seeking missiles, which dramatically increased the percentages of shooting down a helicopter. To counter this threat, pilots developed new techniques, which both supported the ground maneuver commander and reduced the risk of being shot down. Flying techniques that evolved in Vietnam to counter the heat-seeking missile threat included but were not limited to: running fire, maneuvering fire, and performing air-ground

integration. Modern technology has increased the lethality of the heat-seeking threat and the dangers to helicopters.

Army aviation must research and define proper employment techniques that pilots will use to combat modern asymmetrical and linear threats. This research took into effect the capabilities and limitations of modern attack and reconnaissance helicopters. This research explores the attack and reconnaissance helicopter tactics of employment that best address dealing with the asymmetrical and linear threats in a contemporary operating environment?

Anticipated Problems and Limitations

The reliance on unclassified data will limit this research. Another limitation is the data derived from the National Training Center (NTC), Joint Readiness Training Center (JRTC), or other training events. Even though the data from these areas is reliable, it is not derived from combat. However, the technology, capabilities, and limitations of the helicopters in this thesis will be accurate. Also, all threat capabilities and limitations will be accurate. Additionally, weapon statistics that are generated from the factory will not be used. Only current information generated from operational units will be used to portray the effectiveness of the helicopters. The accuracy of all data in this thesis is important to ensure the research is focused and defined.

Significance of the Study

Attack and reconnaissance helicopters tactics must continuously change in order to stay ahead of emerging threats. In order to maintain the advantage, aviation training must be directed toward the training of individuals, crews, and units. Aviation doctrine

must be written in order to train attack and reconnaissance pilots in all possible tasks. Also, aviation training must be realistic and flexible. Aviation schools and units must train individual aviators first in proper techniques and tactics. All aviators must have the basic knowledge of flying the aircraft, employing the weapon systems, and performing air-ground integration.

Next, aviators must be trained with another qualified crewmember. Aircrews must be allotted enough flight time together in order to become comfortable with each other during all types of missions. A trained crew is one who can operate in the contemporary environment in all conditions. They have the ability to communicate with other helicopters and friendly ground vehicles. Finally, crewmembers must perform satisfactory training at the unit level. Realistic unit aviation training includes but is not limited to: gunnery, air ground integration, calling for indirect fire, and performing as a member of an aviation company. Crewmembers also must learn how to plan aviation missions at the company level.

The conclusion of this research will be directed toward the execution stage. Aviation must be synchronized with all parts of the combined arms team. Attack and reconnaissance helicopters have the ability to locate and destroy targets quickly. Attack aircraft can be used also to deceive the enemy, obscure the battlefield, and provide mobile firepower. However, doctrine must be written to train aviators against the current threat. After-action reports (AARs) will help to provide accurate data that will lead to the answer of doctrinal employment for attack and reconnaissance helicopters. Modern tactics, techniques, and procedures (TTPs) are being practiced by Army Aviators in Iraq and Afghanistan in order to combat the asymmetrical threat. TTPs from theater must be

released to all attack and reconnaissance aviators prior to their arrival. The ultimate goal in this research would be to translate these TTPs into doctrine.

Finally, new technologies cannot take away from the importance of properly performing air-ground integration. Even though technology allows pilots to acquire and engage farther than ever before, it cannot replace the capability of working together as a team. The OH-58D, AH-64A, or AH-64D helicopters fighting with a ground-maneuver element result in a significant increase in combat power. AARs from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) prove that commanders at all levels realize the importance of incorporating attack and reconnaissance aviation into the ground scheme of maneuver. During the course of this research, the Army has begun a significant amount of transformation. One of the major goals of the Army's Transformation efforts is to increase the amount of aviation experience and knowledge in the Brigade Combat Teams. Attack and reconnaissance helicopters have proven that when incorporated appropriately, they bring surprise, maneuverability, firepower, and shock effect to the battlefield. However, doctrine must be written and pilots properly trained on air-ground integration in order to make Army aviation more lethal. This research is significant due to the possibility of the results affecting aviation doctrine in concurrence with proving the lethal effects of fighting as a combined arms team.

CHAPTER 2

LITERATURE REVIEW

There are numerous works available for research in attack and reconnaissance helicopter operations. Literary works from the Vietnam era give detail explanations on employment tactics and techniques that were used in a jungle environment against guerrilla forces. Employment tactics and techniques have been documented in urban environments like Somalia in 1993. Desert Storm I, OIF, and OEF offer current research data from desert environments. Also, weapon types and ranges are available for modern helicopters, which will help to provide statistical data. The intent of this research is to translate the findings into TTPs that are needed today. Since attack helicopters have now become an essential part of the combined arms team, research is needed to provide accurate information for employment in support of operations still ongoing in OIF and OEF.

Attack Helicopter Requirements

In order to properly analysis attack and reconnaissance helicopter operations, the requirement for such operations must be explained. In the book *From Hot Air to Hellfire*: *The History of Army Attack Aviation,* James W. Bradin writes about the requirements that led to the development of the AH-1, Cobra, during the Vietnam War. “The Cobra was created for the purpose of providing landing zone support.” UH-1 (Huey) door gunners were not able to provide enough fire support while dropping off troops or supplies landing with their M-60 machine guns. In addition, “the war in Vietnam demonstrated the need for fast gunships” (Bradin 1994, 113). The Soviet Union countered the U.S. with

increased numbers of armored tanks and additional long-ranged artillery. The increase in Soviet military equipment resulted in the U.S. developing a more lethal attack helicopter, the Apache.

Additionally, several books, like *Vietnam The Helicopter War* by Phillip D. Chinnery, *Firebirds* by Chuck Carlock, and *We Were Soldiers Once And Young* by Harold G. Moore, will help to establish the requirement for attack helicopters. These books provide specific missions or tasks that early models of attack helicopters employed during the Vietnam War. These books also provide information on the enemy, the aircraft, and the aircraft weapon's configurations used in Vietnam. A working knowledge of the aviation missions in Vietnam is required to fully understand the requirement for attack and reconnaissance helicopters in the war. Researching the helicopter tactics and techniques used during Vietnam will help answer the employment question needed against the current asymmetrical threat. Even though aviation doctrine was not written for helicopters during the Vietnam War, proper research will provide the foundation of doctrine that was used against the North Vietnamese Army and the Viet Cong from 1965 to 1975.

Attack/Reconnaissance Aviation and Army Doctrine

The Army's doctrine on attack and reconnaissance helicopter operations was written prior to operations in Afghanistan and Iraq. Attack and reconnaissance helicopter operations are explained in several field manuals (FMs). Employment methods briefed in FM 1-100 and FM 1-112 for attack and reconnaissance helicopters explain army aviation's role is to support the mission of the ground maneuver commander. However, as a result of numerous attack and reconnaissance helicopters receiving significant

damage, employment tactics and techniques have changed. In order to provide continuous coverage for the ground maneuver commander, aviation commanders have altered their employment methods to meet the asymmetrical threat. On 23 March 2003 in the contemporary operating environment in Iraq against an asymmetrical threat, the 11th Attack Helicopter Regiments' deep attack mission "did not produce large numbers of enemy battle damage assessment from the AH-64D conventional attack" (V Corps 2003, 2). As a result of the success of U.S. attack helicopter operations during Desert Storm I, "the Iraqis never presented a massed target for AH-64 attacks, and quickly dispersed into cities rather than staying in defensive positions or moving into attack formations" (V Corps 2003, 1). Thirty-two U.S. helicopters received "damaged from small arms, iron-sight Air Defense Artillery (ADA) guns, and Rocket Propelled Grenades (RPGs) while producing only minimum damage to enemy fighters" (V Corps 2003, 1). The results from this battle are clear: U.S. helicopter employment methods must continue to change to succeed against the asymmetrical enemy.

With the arrival of the Apache in 1983, employment methods resulted from the U.S.'s deficit in long-range field artillery guns against the Soviet Union. Cold War planners created the idea of using the attack helicopters against the Soviet Union's long-range artillery in which the U.S. had no other countermeasure. In the book *From Hot Air to Hellfire*: *The History of Army Attack Aviation,* James W. Bradin describes the conditions that helped develop the need for the Army's attack helicopters. He proclaims, "It would be the Soviet tank threat in Europe that sustained attack helicopter development" (1994, 92). The requirement for an attack helicopter that could destroy enemy tanks outside the range of the threat's weapon system became a pressing issue.

The Apache was engineered to meet this threat. As a result of the success of the Apache during DSI, it gained international attention when it led the attack into Iraq. During the early hours of DSI, prior to friendly forces beginning their attack, it was the Apache helicopters that silently crossed into Iraq and destroyed enemy radar sites. It was also the Apache helicopters that destroyed an entire battalion of T-72 Russian Tanks during the ensuing campaign. Another example of the effectiveness of the Apache is noted in the report *Operation Desert Storm- Apache Helicopter Was Considered Effective in Combat, but Reliability Problems Persist* is "278 enemy tanks were destroyed in Operation Desert Storm I (DSI) by the Hellfire Missile from eleven different attack battalions" (Davis 1992, 3). Both of these events were shown on international television, which resulted in the future enemies realizing the lethality of the Apache helicopter. The enemy has changed to meet the operation challenge of the U.S. Army's highly technical attack helicopters. The current threat is reacting much different than the Soviet Union's mass numbers, and army aviation did not change to combat the new asymmetrical threat prior to 23 March 2003. As a result of the mission on 23 March 2003, aviation tacticians realized that employment methods must be correlated to the contemporary battlefield threat. The overall conclusion for individual helicopter training was that students must also be trained and evaluated on operating in the contemporary environment.

Helicopter Security Operations

Prior to AH-64A Apache pure attack battalions, scout helicopters conducted multiple tasks in support of attack helicopter operations. The scout's primary role, OH-58C Kiowa helicopter, was to perform reconnaissance operations. Specifically, the scout helicopter's task was to locate and identify enemy targets for the attack helicopters. Once

the enemy targets were located, the attack helicopters, AH-1 Cobra, would maneuver and occupy an attack-by-fire position. While the attack helicopters were maneuvering to the attack-by-fire position, the scout helicopter would maneuver to the flanks and the rear of the attack helicopters. As the attack helicopters began engaging and destroying the enemy, the scout's mission changed to conducting security for the attack helicopters. This tactic permitted the attack helicopters to concentrate on destroying the enemy without having to worry about becoming engaged on the flanks or the rear. These tactics were included into aviation doctrine until the scout helicopter was permanently removed from attack helicopter battalions. Shortly after the arrival of the Apache, the scout's role was identified as obsolete in the attack helicopter battalion. As a result, Apache helicopter crews had to create additional TTPs for securing the attack-by-fire position, while engaging enemy targets.

Armament Systems (OH-58D, AH-64A, and AH-64D)

All three helicopters provide weapon capabilities for engagements against enemy troops. The main weapon for all three helicopters is the Hellfire missile. The Hellfire missile has the capability of destroying armored vehicles and other targets from great distances. It can be launched independently or remotely from another helicopter. A major difference between the OH-58D, AH-64A, and the AH-64D is the carrying capacity of the helicopters. Additionally, all three helicopters have the capability to carry the 2.75 rocket. The 2.75 rocket can be fired from the helicopters with different warheads and fuses. Depending on the type of target the pilot is engaging results in the warhead and fuse combination. Again, the OH-58D is limited to the carrying capacity of the 2.75 rocket compared to the AH-64A and the AH-64D. Finally, the Apache carries the 30-

millimeter gun, which has the ability to destroy light-armored vehicles and enemy troops. For most Apache pilots, it is the weapon of choice due to its dependability and accuracy. The OH-58D carries the 50-caliber gun for engagements against light-skinned vehicles and enemy troops. The primary reference for weapon loads is the operating manual for each helicopter.

Air-Ground Integration

The importance of conducting air-ground integration surfaced again during OIF and OEF. The key to success in Iraq for the 2nd Squadron, 17th Cavalry Regiment, 101st Airborne Division, was "integration with ground and aviation elements of the Brigade Combat Teams (BCTs) and the Squadron, while the division attacked to secure the cities in Iraq" (Hawley 2002, 03). Additionally, the 1st Battalion, 3rd Aviation Regiment's operations officer during OIF included in his AAR a statement from the division commander, "The Apache is still the Division Commander's premier combat multiplier on a fluid battlefield. This was proven by 1/3rd attack executing ten battalion air combat missions in support of friendly troops in contact against a determined enemy" (Rude 2003, 6). These two statements provide the proof for properly conducting air-ground integration. Since insurgent forces in Iraq are not operating in a linear environment, air-ground integration is even more important. Often intelligence reports do not accurately portray the location and disposition of enemy forces. Operating in an urban environment, ground maneuver commanders are relying on human intelligence not technology. The enemy is blending in with the civilian population and conducting nonlinear operations. Enemy combatants are removing their military clothing and wearing civilian clothing in

order to blend in with the population. Therefore, attack and reconnaissance helicopters are providing current intelligence information and close combat support.

By maneuvering with friendly forces, OH-58D, AH-64A, and AH-64D helicopters provide close combat support. They have the ability to provide mobile firepower with direct-fire weapons. This is especially import in urban operations, when friendly troops are not usually authorized area fired weapon engagements from the field artillery. Attack and reconnaissance helicopters provide the flexibility for the ground maneuver commander. Often launched in teams of two to three, their urban missions include but are not limited to: convoy security, over watch for ground troops conducting search and seizure missions, lift helicopter security, reconnaissance, and close combat support.

The key to success for air-ground integration is “complete understanding of the ground tactical plan and ground maneuver commander’s intent” (3-101st AAR 2002). Once the aircrews have a complete understanding of the ground maneuver commander’s plan, they will receive additional information upon entering into the area of operations. This can be accomplished either via radio or face to face. The preferred method for the most detailed information is face-to-face in order to ensure all information is completely understood. A goal in conducting air-ground integration is increased survivability, while having the enemy react to numerous combat multipliers. New TTPs are being developed for urban operations in OIF. “Providing reaction time for the ground maneuver commander, air-ground integration permits the infantry and armor to maneuver to flank the enemy and complete the destruction. The fundamentals for reconnaissance and

security missions are remaining the same, but flight techniques are changing in order to increase the survivability of the aircrews" (Hawley 2002, 3).

Helicopter Gunnery

The helicopter gunnery manual for all Army helicopters is the TC 1-40. Due to numerous AARs from OIF and OEF, helicopter gunnery has to be incorporated into combat scenarios. Army Aviation can no longer authorize gunnery qualification for crews, who perform static engagements. Table VIII qualifications for crews must include running and hovering fire. In order for attack and reconnaissance pilots to be considered table VII certified, they must pass a rigorous gunnery qualification exercise. Gunnery exercises must not be considered complete unless crews successfully perform a combined arms live fire with armor or infantry. These tables are considered a table XII and are not currently mandatory. However, current information from combat reports that crews trained in table XII exercises are more prepared for supporting the ground maneuver commander. Aviation leaders must continue to gather valid data from combat. TC 1-140 must be updated to reflect the current asymmetrical threat.

Individual Pilot Training

AARs from Iraq suggest pilots graduating from flight school are not ready for the challenges of combat. The current reports from combat suggest that flight school does not prepare pilots for the rigors and operational tempo that erupts during combat. Young pilots do not have the experience to handle the stresses and challenges of combat. Army Aviation must devise a plan to better prepare pilots before they join an operational unit. Pilots must be better prepared in communicating, planning, and executing missions. Due

to the high operational tempo currently in the Army, commanders are not afforded with the training time that is currently needed to prepare pilots for challenges of combat. Once pilots are trained in a specific aircraft, they need to immediately began mission training for their particular aircraft. Included in this training should be current tactical problems that they can be expected to face. Just flying around without being mission focused will not prepare pilots for combat. Additionally, some type of air-ground integration training must take place. Pilots must be trained on communicating and working with maneuver ground commanders. Even though this technique takes years for aviators to perfect, it can be taught and trained during flight school. Finally, once weapon systems and engagements are understood, pilots must be trained on combat roles during live fire scenarios. Army Aviation must also develop a close combat attack school. If a close combat attack school were in operation, pilots would be ready for all different types of engagements prior to arriving at their unit. Having pilots trained in communicating, planning, and executing missions will provide commanders the ability to deploy into combat with crewmembers ready for action.

Crew Flight Training

The final phase of aviation training must be the crew-level flight training. This level of training is also currently conducted at the unit level. Even though specific TTPs are developed and trained at the unit level, pilots need a better understand of this training prior to arriving at their unit of assignment. Once again, additional training time is not afforded to the commander to install the basic combat skills for pilots who do not already possess them. Due to the complexity of flying technical helicopters at night in combat, pilots must be better trained on communicating, planning, and executing missions. In

combat, soldier's lives are at stake and may depend on quality aviation crewmembers. Crews must know how to maneuver their helicopters in urban combat while supporting the ground commander's mission. Crews need to have a thorough understanding of convoy security, which consist of suppressing or destroying the enemy in order to allow the convoy commander the decision time to respond to the threat. Also, "flight techniques are essential to the survivability of the aircrews" (Hawley 2002, 3). AARs from urban fighting in Iraq recommend that "crews maintaining airspeeds above sixty knots and constantly attacking targets from different directions results in the enemy not being able to place effective fires on the helicopter" (Hawley 2002, 03). Therefore, crews must be "trained prior to deployment on maneuvering their helicopter during all tasks" (Hawley 2002, 03). While conducting air-ground integration training in urban conditions, crews must never stop flying and maneuvering. "Bring a helicopter to a hover provides the enemy the opportunity to acquire and hit the helicopter" (Hawley 2002, 03). The attack and reconnaissance Aircrew Training Manuals (ATMs) must be corrected to include evaluations for all tasks under combat scenarios. The tasks must be evaluated while the individual pilot is maneuvering the helicopter.

Joint Training

According to the 1st Battalion, 3rd Aviation Regiment, "Army Aviation units need to conduct significantly more live training with the Air Force and other services" (Rude 2003, 3-4). For years prior to operations in OIF and OEF, Army Aviation shied away from joint training with other services. Even though combat conditions consist of joint operations, the Army did not pursue training opportunities prior to combat operations in Afghanistan and Iraq. Many pilots, prior to entering OIF and OEF, never

conducted live exercises or Joint Air Attack Training (JAAT). The reasons for the lack of training are many. However, a major reason for the lack of joint training was scheduling challenges with training schedules. Due to the numerous training requirements on aviation units, joint training has never been considered a high priority. Additionally, the planning for conducting a joint training exercise is very complex. Reserving training areas large enough for fixed and rotary wing aircraft takes additional man-hours. Joint training exercises also require enormous budgets due to the high cost associated with aviation operations. The future for the United States military is joint operations. Therefore, all branches of the military must learn how to work closer together. Future training must include the army, navy, air force, and the marines working together.

CHAPTER 3

RESEARCH METHODOLOGY

The intended research design for this thesis is to compare employment methods, weapon loads, and combat missions for attack and reconnaissance helicopter operations from OEF and OIF. The results from combat missions will provide evidence as to the best employment methods to perform in a contemporary operating environment. Different tables and models will be researched to demonstrate the results of multiple missions. Research will also show friendly aircraft losses, battle damage assessments (BDA), and weapons loads in comparison to the missions in which they were performing. Emphasis will be on showing the effectiveness of the point fired weapon systems at different ranges. Information representing the Hellfire missile, 50-caliber machine gun, and the 30-millimeter chain gun will be presented. All data for analysis will derive from either historical literature, aircraft operating manuals, attack and reconnaissance employment manuals, or current AARs from OEF and OIF.

AARs from combat operations, to include contemporary operating environment, in OEF and OIF will be analyzed. The AARs will provide evidence of the missions, weapon loads, and their results. Multiple employment methods will be analyzed and compared to demonstrate the best method for target effects, including aircraft survivability. The OH-58D, AH-64A, and AH-64D will be the aircraft used for this research. The results from this research will provide the evidence for answering this thesis's main question, The best employment method of attack and reconnaissance aircraft operating in a contemporary operating environment.

Besides AARs from OIF and OEF, historical information will also provide insight into proper employment methods and weapons loads for attack and reconnaissance aircraft. Research data from earlier military operations involving attack and reconnaissance helicopters will provide concrete data as to what did and did not work well. Information from previously successful employment methods might help modern aviation operations. An example of a successful employment method was to maneuver continuously during an engagement rather than hover (Bean 1964, 7). During Vietnam, helicopter pilots had to maneuver continuously in order to prevent the enemy from synchronizing their direct fires on the aircraft (Bean 1964, 8). Prior to OIF and OEF, attack and reconnaissance pilots had not trained on this tactic for many years. As a result of not training on the tactic of maneuvering continuously during an engagement, pilots had to reacquire the skills of engaging the enemy with running fire versus hovering fire. Running fire reduces the amount of time the enemy can acquire and implement direct fire on the aircraft. After deep operation missions, where attack helicopters, obtained very little BDA and suffered serious damage, TTPs were created to engage the enemy differently. Previously attack helicopters in OIF and OEF engaged the enemy, while at a hover instead of maneuvering continuously. Also during OIF and OEF previously used weapon loads proved to be relevant again. The 2.75 rockets, which contained aerial burst rounds, again proved their relevance in modern combat. This historical information will also be included in the research data for answering the thesis's question.

Not only will AARs and historical data provide insight into the best employment methods, but also a basic knowledge of attack and reconnaissance helicopters is required. Aircraft operating manuals for the OH-58D, AH-64A, and AH-64D will used to provide

the weapon types and characteristics. Weapon systems on the OH-58D include the Hellfire missile, the 50-caliber machine gun, and the 2.75 aerial rocket. The AH-64A and AH-64D also carry the Hellfire missile and the 2.75 aerial rocket, but have the 30-millimeter chain gun. The 30 millimeter can range farther and is more lethal than the 50-caliber machine gun. The 30 millimeter receives fire control information from the fire control computer. The addition of the fire control computer on the AH-64A and AH-64D allows the 30-millimeter chain gun to be a point fire weapon. The 30 millimeter and the Hellfire missile provide AH-64A and AH-64D pilots the capability to have two point-fired weapon systems. Point-fired weapons provide the pilot with the ability to destroy an enemy targets. The 2.75 rocket system is intended for suppression of an area target. Each individual weapon system is designed against a different target array. Research will show different types of missions, weapon loads, and recent evidence as to the effectiveness of each weapon system. The results will also verify the purpose of having multiple weapon systems, which is to provide flexibility in attacking different types of targets simultaneously.

Employment methods of attack and reconnaissance aircraft from OIF and OEF will help to provide the baseline data for this thesis. Aviation missions performed with a ground maneuver role in OIF and OEF will most likely produce increased amounts of BDA. Additionally, missions performed with an air-ground integration role have the ability to reduce friendly aircraft losses. Aircraft maneuvering in support of Abram Tanks or Bradley fighting vehicles are much less likely to suffer catastrophic damage. Maneuvering in support of the ground commander's role helps to reduce the vulnerability of the aircraft. Aviation missions in support of friendly ground vehicles also have a direct

evacuation plan. AARs from OIF and OEF will provide evidence of quickly recovering injured pilots in missions that included friendly vehicles. However, aviation missions involving attack and reconnaissance aircraft going far ahead of friendly lines will most likely produce different results.

Finally, combat missions involving attack and reconnaissance helicopters maneuvering far ahead of friendly ground tanks and vehicles will most likely produce different types and amounts of BDA than those operating in the close combat role. Aircraft operating in a deep operations role are intended to perform shaping operations, which will eventually affect the close fight of the ground maneuver commander. However, since the aircraft are operating independently of friendly ground maneuver vehicles, their only support is that of the field artillery and close air support from the Air Force. As a result of the absence of friendly vehicles, attack and reconnaissance aircraft operating deep have to create their own evacuation plan for injured or down pilots. These types of missions are also normally planned against a different target array than those performing an air-ground integration role. Therefore, their method of employment will be much different. Research will show the target sets and the BDA results from these missions that were performed in OIF and OEF.

CHAPTER 4

ANALYSIS

The intent of this chapter is to build a comparison of the army's reconnaissance and attack helicopters and their individual missions in a contemporary operating environment. While analyzing AARs from OIF and OEF, research will compare helicopter capabilities versus asymmetrical threats. Once the capabilities are defined and compared to the limitations of the helicopters, AARs from OIF and OEF will help to provide the required data for answering this thesis. Gathering of data and conducting thorough research will help clarify the question: What are the proper employment TTPs for attack and reconnaissance helicopters operating in a contemporary operating environment?

Defining Contemporary Operating Environment

A doctrinal definition of contemporary operating environment is required before analyzing the capabilities and limitations of the Army's attack/reconnaissance helicopters. The Army's Center for Lessons Learned (CALL) defines contemporary operating environment as: "The overall operational environment that exists today and out to the year 2020. Potential opponents will continue to modernize even though no country will be able to compete militarily with the United States out to at least year 2020" (Strategy World.com, 2005). Already considered to be high tech, the battlefield will continue to advance. Weapons, which threaten helicopters, will also continue to be more effective and lethal. Therefore, Army Aviation must not become complacent in developing TTPs that will effectively combat asymmetrical threats. TTPs are those

practices that a unit implements to help create desired effects and, no single TTP will be able to combat all the environmental threats to attack/reconnaissance helicopters. The enemy will always use every possible means to level the battlefield in order to meet his success. As noted from several AARs in OIF and OEF, the days are gone where the Apache helicopters enter an attack-by-fire position, perform a stationary hover, and engage enemy targets. As analysis will show, a hovering helicopter is a much easier target. Therefore, it is much easier to engage a stationary helicopter than one that is moving. As in Iraq and Afghanistan, opponents will continue to figure out ways to compete with the United States, which includes developing asymmetrical methods.

Defining Asymmetric Warfare

In order to compare and contrast employment methods, a complete understanding of asymmetrical warfare is required. Asymmetrical warfare is defined as "a condition of ideological, cultural, technological, or military imbalance that exists when there is comparative strengths and weaknesses including adapting to an opponent's overwhelming force by avoiding heavy contact and exploiting his weaknesses" (Strategy Worldcom 2005). Future opponents including adversaries, who are not state sponsored, will continue to research new ways of combating the United States. Low technological ways of creating devastating results will be their focus. An example of this will be engaging high technological helicopters with inexpensive weapons including small arms and rocket grenades. A possible means of conducting asymmetrical warfare against the United States is disrupting computerized nodes. Since the United States military is dependant on its technological information, future opponents will focus on destroying our communication and detection capabilities. "Future opponents will seek terrain, including

urban warfare, in order to combat the United States Military" (Strategy World.com 2005). Finally, attacking ports and airfields in theater prior to the United States military arriving is another effective means of conducting asymmetrical warfare. Therefore, the United States must continue to increase its force protection capabilities in the future in order to help prevent the enemy from attacking its vital areas.

Weapon systems, Capabilities, and Missions (Kiowa Warrior, Apache, and Apache Longbow)

Currently, the Army's reconnaissance helicopter is the Kiowa Warrior. It has four radios that allow the crew to communicate concurrently with adjacent aircraft, friendly ground vehicles, fire support nets, and higher headquarters. The frequency modulation (FM) radios are connected to a power amplifier. The power amplifier gives the pilot the ability to communicate at extended distances. The main direct fire weapon on the Kiowa Warrior is the hellfire missile system. The task and purpose of the hellfire missile system is to destroy enemy tanks and vehicles from extended distances. Depending on atmospheric conditions, hellfire missiles can destroy enemy armored vehicles up to eight kilometers. The Kiowa Warrior has the capability to carry up to four hellfire missiles. Additionally, the Kiowa Warrior carries the 50-caliber machine gun. The 50-caliber machine gun mounted on the helicopter is designed for enemy troops and lightly skinned vehicles. Its maximum effective range is 2,000 meters even though it can engage enemy targets at further distances. The last weapon system on the Kiowa Warrior is the aerial rocket system. The OH-58D has the ability to carry two rocket pods. Each rocket pod will carry seven individual rockets. Aerial rockets are designed for suppressing the enemy or

for engaging lightly skinned vehicles. Suppressing the enemy helps provide the pilot with the capability to break enemy contact before the helicopter becomes engaged.

Even though the Kiowa Warrior has the ability to engage enemy targets with its autonomous weapons systems, its primary system is the mast-mounted site (MMS). The MMS is the sight, which is located on top of the Kiowa Warrior. One of the capabilities of the MMS is the thermal imaginary sight (TIS). The TIS allows the pilot to locate, observe, and track numerous types of enemy elements in the dark. The MMS also has powerful day scope, which gives the pilots the ability to zoom in and identify enemy troops and vehicles. The MMS is also connected to a laser, which can help to locate enemy targets with pinpoint accuracy. The laser combined with a direct fire weapon system provides devastating results on the battlefield. The MMS is a remarkable asset for the crew and can be used in either the day or night mode. With the MMS, four radios, and the capability to destroy enemy targets, the Kiowa Warrior is designed to fully support the ground maneuver commander's mission.

The Kiowa Warrior's main purpose is to be an aerial scout for the ground maneuver commander. The aerial scout role can be performed in many ways. However, the most important method of supporting the ground maneuver commander is air-ground integration. The Kiowa Warrior is the perfect helicopter for conducting air-ground integration. It can be operated with or without the side doors. Flying the Kiowa Warrior without the doors allows the crewmembers quicker access for conducting air-ground integration because the crews can exit the helicopter much faster. Additionally, flying without the doors allows for a cooler environment for the crewmembers operating in warmer climates. Also, due to the small size of the helicopter, the Kiowa Warrior does

not require much area to land. While conducting air-ground integration, pilots can land, jump out, and conduct a face-to-face meeting with the ground maneuver commander without hampering helicopter coverage. These reasons make the Kiowa Warrior an awesome helicopter for conducting air-ground integration. Basically, it is the ground maneuver commander's eye in the sky. A typical TTP for Kiowa Warriors supporting the ground maneuver commander is to maneuver ahead of friendly tanks and vehicles until enemy contact is made. After contact is made with enemy tanks or vehicles, the Kiowa Warrior maneuvers directly over the top and behind friendly ground elements. This position allows the Kiowa Warrior crew to continue to provide aerial coverage, while having the protection of friendly tanks below them. Since their total station time is normally two hours, combat planning must include forward area refueling points (FARPs) in close proximately (15 to 25 kilometers) of the operation. The amount of coverage that Kiowa Warriors can provide is mostly limited by fuel, adverse weather, or intense surface to air missile threats. Currently, the Army has no better tool for conducting air-ground integration than the Kiowa Warrior.

Another primary mission for the Kiowa Warrior helicopter is serving as a laser designator for remote hellfire shots or operating as a forward observer for the field artillery. As combat continues in OIF and OEF, the Kiowa Warrior continues to prove it worthiness in the ground maneuver commander's mission. Even in urban combat, the Kiowa Warrior is proven a valuable asset by lasing and conducting target handovers to friendly ground units. It is also performing the mission in urban combat of conducting over the shoulder reconnaissance for ground troops as they perform their search and seize missions. The Kiowa Warrior has the unique ability to accomplish many tasks

simultaneously including identifying and destroying targets quickly without being detected. Whether destroying enemy targets by autonomous hellfire engagements, sensor to shooter calls for fire with the field artillery, conducting a remote hellfire shot with another helicopter, or conducting a target handover to a friendly ground element, the Kiowa Warrior continues to prove its validity to the ground maneuver commander. The Kiowa Warrior also possesses the capability to acquire targets with the MMS without having to leave its concealed position. This creates the opportunity for destroying many enemy targets via remote hellfire shots with the Apache, Apache Longbow, or another Kiowa Warrior. Additionally, the Kiowa Warrior that is designating the enemy targets can continue its mission without being detected due to the absence of smoke or light that is normally created from firing helicopters. Also, due to the accuracy of the Kiowa Warrior's laser, first time calls for indirect fires mostly hit enemy targets. This sensor to shooter relationship with the field artillery creates destruction to the enemy and provides the flexibility for Kiowa Warriors to perform multiple missions.

Finally, the Kiowa Warrior's intended missions are mainly reconnaissance missions (route, area, and zone). However, if required, the crews are trained on conducting hasty attacks. With the ability to maneuver quickly without being hindered by ground obstacles, the Kiowa Warrior is ideal for reconnaissance operations. Kiowa Warrior helicopters conduct reconnaissance operations ahead of friendly ground elements in order to create reaction time and maneuver space to the ground maneuver commander. Providing additional reaction time to ground forces can be vital in combat. Such information might be: possible mines, obstacles, or location/disposition of enemy ground forces. During convoy operations, Kiowa Warriors provide observation and close combat

support operations. A point continuously noted on an AAR from 2nd Squadron, 17th Cavalry Regiment from combat operations in OIF is “enemy attacks are much less likely, when scout and attack helicopters perform convoy over watch” (Hawley 2002, 02). When Kiowa Warriors maneuver in support of convoy operations, friendly forces have a combined arms approach for supporting their mission. Kiowa Warrior helicopters provide additional eyes and the mobile fire support to destroy the enemy without the convoy becoming decisively engaged. Additionally, Kiowa Warrior helicopter support to convoy operations allows friendly vehicles to move much faster. Normally, reconnaissance and convoy security operations are conducting using two to three Kiowa Warriors. This allows for one to two helicopters to be on station, while one helicopter is in the forward area refueling point (FARP) for refueling and re-arming. For all these reasons, the Kiowa Warrior helicopter is a combat multiplier, which no ground commander should go into battle without.

Not only does the Army have a superior reconnaissance helicopter, but it also has magnificent attack helicopters in the Apache and Apache Longbow. Depending on weapon requirements, both helicopters have the ability to carry hellfire missiles, aerial rockets, and 30-millimeter ammunition. The biggest combat advantage that Apaches have over other attack and reconnaissance helicopters is the amount of armament that it can bring to a battle. The Apache and the Apache Longbow have two engines, which greatly enhance their overall performance capability over helicopters with only one engine. With their increase in performance capability, they can carry a maximum of sixteen hellfire missiles or seventy-six aerial rockets. The Apache and Longbow also have the forward-looking infrared (FLIR). The FLIR is used for the pilot to fly and the copilot to acquire

targets. The advantage of the FLIR over night vision goggles is that it performs better during low illumination. Basically, the FLIR allows the pilot to see more clearly in low illumination. With the creation of the Longbow Apache, pilots now have the ability to digitally track 256 targets. The targets are prioritized by the fire control computer from the most dangerous to the least dangerous to the helicopter . Also, all 256 targets are passed as digital spot reports to a higher headquarters. The addition of the Longbow also permitted the gunner to engage three enemy targets with three hellfire missiles at the same time. Since they have two engines, the Apache and the Longbow Apache can also travel much faster than the Kiowa Warrior. Their normal cruising airspeed is above 125 knots. Until the creation of the Apache Longbow, the Apache had only three radios. Only one of the radios was a FM, which meant that the crew could not speak with the ground maneuver commander and call for friendly artillery support simultaneously. This also increased the difficulties of properly conducting air-ground integration with the ground maneuver elements. As a result of the lack of communication, target handovers and clearance for indirect fires became extremely difficult. As the Apache Longbow began replacing the Apache, the communication problem started to decline. With the addition of another FM radio, the Apache Longbow had the same communication package as the Kiowa Warrior helicopter. As a result of an additional FM radio and the technological capability to conduct reconnaissance operations, the Apache Longbow started performing both attack and reconnaissance missions.

The Apache and the Apache Longbow's primary mission are to conduct attack helicopter operations in support of the ground maneuver commander. Attack helicopter operations are conducted in many ways. One of the ways which Apaches support the

ground maneuver commander is with shaping operations. Apache helicopters are used to conduct shaping operations in order to affect the enemy deep in his battle space. These operations provide the ground maneuver commander with the freedom of maneuver before engaging the enemy's second and third echelon forces. The Effects Coordination Cell (ECC) coordinates shaping operations or deep attacks. The ECC plans, coordinates, and tracks Apache helicopters during the mission. Deep attack operations are supported with close air support and multiple rocket system artillery. Deep attack operations are intended to destroy enemy targets, such as extended range artillery units, tank battalions, mechanized infantry units, and fixed radar sights. During the operation, rocket artillery provides ingress and egress suppression of enemy air defense (SEAD). The primary task of multiple rocket system artillery is to kill or disrupt enemy air-defense systems, while the Apaches are maneuvering to and from the attack-by-fire position. Once the Apaches arrive in the attack-by-fire position, they use direct fire weapons plus close air support to destroy the intended targets. During deep attack helicopter operations variables exist. The enemy always has a vote in the fight. Therefore, the array of enemy targets changes continuously. The location and disposition of enemy forces continues to change. Without friendly ground forces providing continuous target handovers problems often arise. If enemy targets move before the Apaches visually acquire them, then this can possibly create a disruption in the deep-attack sequence. Also, without friendly ground forces being in the vicinity of the engagement, multiple rocket system artillery operations are not reliable. Any pilot shot down during the mission is normally recovered via extraction with another Apache helicopter. Extraction is accomplished by the downed crewmembers connecting themselves to the outside of the Apache helicopter. The variables of target

location and the absence of a quality search and rescue plan result in deep attack helicopter operations often being considered high risk.

Another type of attack helicopter operation is the close combat attack. Close combat attack operations are focused on killing the enemy with the assistance of friendly ground troops. The intent behind close combat attack operations is to focus the Apache's weapon systems on the enemy that is in direct contact with the supported ground forces. Operations are planned, coordinated, and rehearsed with friendly maneuver forces. During the operation targets are passed between ground forces and attack helicopters. Close combat attack operations also include urban operations. Apaches maneuver in support of friendly ground troops. Apache helicopters can help to clear buildings with the use of their night seeing sights and direct fire weapons. They have the capability to provide mobile fire support to ground troops in contact. Apaches react swiftly and violently in support of the ground maneuver forces in contact. As the enemy maneuvers, Apaches receive current location and disposition information from the friendly ground element in contact. This information speeds the engagement process up and reduces the amount of time that the helicopter is vulnerable to shoulder fired weapons. Also, in the event of the helicopter getting shot down by enemy fire, friendly ground forces are in the engagement area. The ground forces will recover the downed aircraft crew. They have the ability to secure the aircraft and provide immediate first aid. Additionally, one attack battalion can support numerous close combat attack missions simultaneous because each mission usually requires two to three attack helicopters per operation verse the entire battalion for a deep attack mission. Finally, the overall result of having only a small

portion of attack helicopters committed to one operation provides the flexibility for the attack battalion staff to be planning for another operation.

Scout/Attack Weapon Teams vs. Independent Operations

Before the Apache and the Apache Longbow, the Army's previous attack helicopter (Cobra) pilots were trained on maneuvering with reconnaissance helicopters. The TTP for Cobra pilots maneuvering with the scout pilots was for the scout helicopter crew to acquire enemy targets and provide the target handover information to the attack helicopter crew. Since the scout helicopter had no direct fire weapon systems, it relied on the Cobra helicopter to provide covering fires. The Cobra's main task was to protect the scout from the enemy. Tactics were taught and missions were practiced creating scout weapon teams. The scout weapon concept was proven to be extremely effective in supporting the ground maneuver commander. Attack and scout pilots were also trained on the TTP of maintaining communications with the ground maneuver element and the other helicopter simultaneously. Maintaining communication with all members of the combined arms team allowed for a high level of situational awareness. Additionally, TTPs were created upon enemy contact the reconnaissance helicopter would disengage, report, and observe. The Cobra would then maneuver, engage, and destroy the enemy with its direct fire weapons. The outcome of this TTP was an increase in helicopter survivability and the survivability of all crewmembers. Continuously training these TTPs and other tasks helped to reassure that all members of the combined arms team knew exactly what to expect. As a result of planning and executing together, less friendly fire accidents were likely to occur. Also, target handovers were much easier to complete. Prior to all operations, rehearsals were conducted, which helped to decrease the response

time for clearance of indirect fires and increased the participants' situational awareness. However, these TTPs started to change once the Apache replaced the Cobra.

With the arrival of the Apache, attack pilots started having to pick up the role of the scout, which was to locate, track, and report the enemy. The required tasks of flying the helicopter and shooting the enemy became overwhelming, while having to perform the additional duties of the scout helicopter. Whereas the scout helicopter crews used to perform target handovers, communicate with multiple rocket system artillery/close air support, and perform attack-by-fire position security, Apache pilots now had to also incorporate these tasks into their training. Also, with the arrival of the Apache, senior aviation commanders created attack helicopter battalions excluding the scout helicopter. As a result of this realignment in aviation units, relationships were lost between the scout and the attack community due to the lack of training together. This also created attack pilots who could not communicate with the ground maneuver commander because the attack battalions mostly concentrated their training efforts on deep attack operations. Therefore, Apache pilots lost the ability to properly conduct air-ground integration. For the last twenty years, attack pilots were only trained on independent attack helicopter operations. Where the scout used to provide target handovers and conduct security of the attack-by-fire position, attack helicopters had to fill this role. This created numerous adverse effects. One negative effect was that Apache cockpits became increasingly complex. According to Apache Instructor pilots, "attack pilots could no longer focus entirely on engaging the enemy. Some cockpits became over tasked and sometimes unsafe." This was especially true at night. As a result of an increase in technological requirements, multiple tasks were added to the attack pilots. Operating independently,

attack pilots had to do more than fly and shoot the weapon systems of the Apache. “Cockpits became so involved that some of less experienced crews were considered combat ineffective” according to numerous AARs from The National Training Center. As a result of attack helicopter battalions composed entirely of Apaches, the absence of the reconnaissance helicopter created a void. Additionally, AARs from The National Training Center prove that “there were few positive results of attack battalions operating without the scout helicopter other than the ability to travel further and faster. However, the overall result was a decrease in direct support for the ground maneuver commander and the loss of the relationship with the reconnaissance helicopter.”

The gun scout relationship with the Apache and the scout helicopter continued to diminish with the arrival of Apache Longbow. Even though the Apache Longbow helicopters continued to be organized into independent attack battalions, it had the capability to conduct armed reconnaissance operations. With the ability to gather intelligence and destroy multiple enemy targets with direct and indirect weapons, senior aviation commanders pushed for the elimination of the Kiowa Warrior. The thought process was that the Apache Longbow could perform all attack and reconnaissance tasks. However, as previously stated with the Apache helicopter operating without a scout helicopter, the problem of information overload became even more prevalent in the Apache Longbow cockpit. Basically, without reconnaissance helicopter support, there was nothing put in its place to perform the mission. Numerous attack pilots are claiming, “Apache Longbow pilots are having an increased amount of difficulty in destroying multiple enemy targets, while operating all the systems on the helicopter.” Additionally, the air-ground integration role of the Apache Longbow and the ground maneuver element

has continually fallen to the side. Even though air-ground integration can be conducted over the radio, it is not the preferred way and as a result of additional requirements in the cockpit, Apache Longbow pilots are even less likely to land and conduct a face-to-face meeting with a ground maneuver leader. Therefore, without an air scout available to conduct the face-to-face meeting with a ground maneuver leader all possible information is not fully exchanged.

Even after the conversion from the standard Army observation helicopter being upgraded to the Kiowa Warrior version, senior attack helicopter commanders seemed to continue to disregard the role of an armed scout helicopter. Army Aviation's Branch Chief, Major General Burns, suggested "the elimination of the Kiowa Warrior helicopter in the United States Army," while at the 2001 Digital Communication Exercise at the National Training Center. Senior Army Aviation Commanders might have forgotten the effectiveness and versatility of a trained aerial scout. As a result of both the Apache and Apache Longbow combining into independent attack battalions, the Kiowa Warrior Community became more focused on integration with the ground maneuver commander. The Kiowa Warrior's role was moved to primarily performing air-ground integration in divisional cavalry squadrons. Therefore, scout pilots became highly trained on supporting the ground maneuver commander. Additionally, the Kiowa Warrior helicopter proved repetitively that the air scout held an important role in ground maneuver operations. After armament systems were mounted on the Kiowa Warrior, it had the capability to perform both direct and indirect fire engagements.

When Kiowa Warrior helicopters conducted direct fire engagements in support of the ground maneuver commander's mission during training exercises, it validated its

purpose as a member of the combined arms team. Operating in pairs or teams, Kiowa Warrior crewmembers were able to clearly understand and support the ground maneuver commander's tactical plan. The counter argument for Kiowa Warriors conducting air-ground integration was the lack of mobile firepower on the helicopter. Even though the Kiowa Warrior possesses superior night sensors, the helicopter does not have the capability to bring a significant amount of mobile fire support to the fight. However, modern ground maneuver commanders continued to envision the effectiveness of an armed scout as Kiowa Warrior pilots became proficient in effectively conducting air-ground integration. In order to properly conduct air-ground integration, crewmembers must attend rehearsals while leaders plan the ground scheme of maneuver. At the combined arms rehearsal, frequencies and call signs are distributed prior to start of the mission. A lesson learned from personal training exercises was a more sound communication plan when Kiowa Warrior pilots attended the combined arms rehearsal. Also, having positive communications with ground maneuver elements ensure intelligence reports are passed along common frequency channels so that all friendly elements understand the current battlefield situation. Another benefit of attending the rehearsal is for the crewmembers to gain a more clear understanding of the locations of friendly and enemy forces. This greatly reduces fratricide and enhances the lethality of armed aerial reconnaissance teams. Properly conducting air-ground integration also involves night seeing capabilities being used to there fullest potential. Ground and air elements have the ability to see and locate different enemy forces at night based on different sensors. For example, Abrams tanks have the disadvantage to locate different enemy targets based on their location on the battlefield. The angles of targeting enemy

vehicles and locations are much more difficult to see from a ground base element than an air element. For these reasons, most ground maneuver commanders insist on the assistance of attack and reconnaissance helicopters during combat operations in OIF and OEF.

Deep Attack Lessons Learned from OIF and OEF

Combat AARs from 2/6 Cavalry 11th Aviation Regiment, V Corps Attack Aviation, and 1st Battalion 3rd Aviation Regiment "stress the intensity of the modern battlefield and the lethality of a modern enemy." These reports also agree, "the enemy is intelligent and continuously creating asymmetrical ways of engaging attack helicopters." The AAR from 1st Battalion 3rd Aviation Regiment on operations in OIF missions "state the path to successful attack helicopter operations is to have pinpoint intelligence with quick reaction." According to unclassified briefs at the Army's Command and General Staff College "during the initial advancement into Iraq, the army extended its fire support coordination line. This was likely an attempt to prove the validity of sending multiple attack helicopters past the forward line of the troops in pursuit of enemy armor and artillery units." Having a large area in front of the ground forces and behind the fire support coordination line would allow for limited operations of fixed wing aircraft. However, the 1-227th 11th Aviation Regiment AAR from OIF suggests "that the enemy was more synchronized and ready than they had been in Desert Storm I for deep attack helicopter operations." Additionally, briefs at the Army's Command and General Staff College emphasized "the enemy's high state of combat readiness against Apache helicopter operations. The enemy had planned and prepared for combat against Apaches by concentrating on unlighted areas for ambushes, where attack helicopters might

establish ABFs [attack-by-fire positions].” These types of ambushes prove that the enemy in OIF and OEF planned on using asymmetrical warfare for combating the lethality of the Army’s attack helicopters. The enemy also prepared for the Apaches to operate forward and free of any friendly ground maneuver elements. They had researched our night seeing capabilities and war-gamed solutions to fight the overwhelming firepower of the Apache and Apache Longbow helicopters. Additionally, prior to the start of OIF and OEF, the enemy had learned how to recognize a pure Apache or Apache Longbow deep attack. They basically planned for: multiple attack helicopters launching after dark and move along an axis in order to destroy their equipment. As a result of becoming complacent, the attack helicopter community had allowed itself to be easily templated.

By training only on deep attack helicopter operations for over twenty years, Army Aviation had allowed itself, prior to combat operations in OIF and OEF, to become easily recognizable. Due to only focusing on the tasks for deep attacks, Army Aviation lost its advantage of flexibility in attack helicopter operations. One key take away of all attack helicopter operations from OIF and OEF is to diversify in order to prevent the enemy from knowing when and where Apache helicopters might enter a battle. Even though Apaches have overwhelming firepower, aviation planners must never allow themselves to be easily war-gamed. Furthermore, combat commanders continue to agree that deep attack operations have a role in Army Aviation. However, they should not be the only type of mission that attack aviators are trained. Attack helicopters can conduct shaping or deep attack operations. However, AARs from OIF and OEF suggest that helicopter deep attacks are a high-risk mission. The 11th Attack Helicopter Regiment conducted an example of a high-risk deep attack mission in OIF. As a result of the lack of intelligence

and not properly knowing the enemy, the 11th Attack Helicopter Regiment suffered damaged to more than thirty helicopters, while lost one crew as missing in action initially. This mission proved that deep helicopter attacks should only be planned and conducted, when no other assets are available. Sending attack helicopters deep requires an enormous amount of synchronization. From the author's perspective, some of the most important factors needed for a successful deep helicopter attack are: an increase in aviation fuel ready and available, a combination of all obtainable intelligence sources in order to focus on the deep attack mission, an increased amount of manpower, and a proven plan for multiple rocket system artillery for any downed aviators.

Even though three of the four factors mentioned above are possibly obtainable given enough effort and emphasis, one has never been proven. From the beginning planning stages of deep attack helicopter operations, there has never been a proven plan of search and rescue for any downed attack pilots. Army Aviation has just basically ignored the entire process of search and rescue during training exercises. There has never been a consistent and proven plan under all conditions for search and rescue. Ideas have ranged from self-extraction, to the pilots maneuvering to a downed pilot pickup point, to finally a Blackhawk (search and rescue helicopter) flying in trail of the attack helicopters. Self-extraction is defined as removing the downed crewmembers by attaching them to another helicopter. Once the down crewmembers are attached, they are flown to safety. A key problem with this technique is the variables of the downed crewmembers and the likelihood of one of them being injured. They quite possibly might not have the strength to hold on to the helicopter, while being flown to safety. The idea of the downed crewmembers maneuvering to a downed pilot pickup point also does not take into

consideration of one or both crewmembers being injured. Finally, the idea of using a Blackhawk is also unacceptable because of the helicopter being susceptible to whatever shot down the Apache. For the above-stated reasons of not having a proven plan for search and rescue, aviation planners must only use Apache and Apache Longbows in deep attack helicopter operations if no other suitable assets are available.

Another highly visible problem with deep attack operations in OIF and OEF, other than the lack of a suitable search and rescue plan, was that deep attack operations are highly dependent on technical intelligence such as Joint Surveillance Target Attack Radar System (JSTARS). Due to the operations taking place far ahead of friendly ground elements, the positions of enemy locations are communicated through digital means and are most likely not coming from human intelligence (HUMINT). Other than the possibility of a Special Forces unit being able to locate and report enemy armor or artillery locations, intelligent reports that are used to conduct deep attacks are most likely coming from satellites or unmanned aerial planes. The enemy is familiar with these types of detection capabilities and has devised multiple deception plans in order to elude them. With the enemy having the advantage of the home court, they have the ability to hide and move at their convenience. During the deep attack mission, if the enemy decides to move and or relocate, there are little proven means available to get this information in the cockpit of the attack helicopter crews in a timely manner. A possible example of this issue is: the enemy maneuvers during the time the Apaches depart and before they are set in the attack-by-fire position. If this occurs then the FM radio is the only proven secure means available to get this critical information to the crewmembers. However, the greatest problem arises if the Apaches are outside the reach of the FM radio.

If the Apache Longbow's have flown outside the FM radio range of the command element, the only other possible means available to transfer critical information is digitally. The Apache Longbow is the only attack helicopter that can only accomplish this. The Apache A model does not have the capability to receive and transmit digital information. Also, prior to the beginning of OIF and OEF few Apache Longbow crewmembers possessed the knowledge of digital transfer information due to the task being difficult to train. Basically, the skill of digital message transfer was not often practiced because it took too much effort to locate friendly units in which to train. The lack of knowledge and training was evident at an AAR during the digital communication exercise at The National Training Center in April 2001, when most of 1-227th Apache Longbow pilots could not demonstrate the skill of sending and receiving digital messages. As a result of the lack of command emphasis, few attack pilots were proficient in communicating digitally with friendly ground elements. Another, handicap of digital message transfer was as mentioned previously, cockpit overload. The task of digital message traffic again increased the workload of the AH-64D crew. The crewmember in the front seat would be completely involved in digital message transfer and would be unable to perform any other task.

Overall, deep attack operations are an effective tool for the ground maneuver commander if they are planned with detailed synchronization and an increase of manpower. Deep helicopter attacks also can effectively shape the battlefield when used appropriately. However, these missions must not be the only type of attack helicopter operation that Apache pilots are trained on. The Apache helicopter is suitable for multiple types of missions, and attack aviators should be trained on all of them. Also, more

research must be placed on identifying an effective search and rescue plan for downed aviators. Attack pilots are much more likely to submit themselves to high-risk missions if they know that a proven rescue plan is available. Additionally, if deep attacks are going to be successful in the future, they must also continue to be used in support of the ground scheme of maneuver. Finally, more research must be focused on identifying a quick and effective means of receiving current enemy information into the cockpit. Having a proven system capable of transferring current enemy positions into the cockpit will help to reduce the amount of time for an engagement. Even though radio traffic will work, it is not the most expeditious means available.

Apaches in the Close Combat Role in OIF and OEF

Attack helicopters, once questioned as to whether or not they are a maneuver element, have proved, according to an AAR by 1st Battalion 3rd Aviation Regiment, in OIF that "they are vital to the ground maneuver commander in multiple ways other than deep attacks." As combat continued to intensify in OIF and OEF, ground maneuver commanders began to request the Apache helicopter support in a close combat role. While fighting as a member of the combine arms team, attack helicopters are able to provide immediate and continuous close combat support, increase their survivability, and reduce possible fratricide to friendly troops and vehicles. Apache helicopters performing close combat missions in OIF and OEF provided "overwhelming firepower support to the ground maneuver commander, while validating their role in the future" (Rude 2003, 3).

AARs from 1st Battalion 3rd Aviation Regiment and 3rd Battalion 101st Aviation Regiment provided information that "the Apache performed the close combat role with flexibility and reliability." A tactic technique and procedure (TTP) that was proven

successful in OIF and OEF was supporting the ground maneuver commander with multiple teams of two attack helicopters. The concept by Apache helicopters operating in the close combat role is continuous coverage. With one attack battalion consisting of twenty-four Apache or Apache Longbow helicopters, they have the capability to provide a maneuver brigade commander with twenty-four hour coverage. The process of always having two attack helicopters on station provides the ground maneuver commander with immediate and continuous close combat support. Another AAR comment from both 1st Battalion 3rd Aviation Regiment and 3rd Battalion 101st Aviation Regiment suggest that "having multiple teams of two attack helicopters staggering their duty cycle will increase aviation presence and participation in the combined arms rehearsal." Normally, due to their fighter management cycle, attack helicopter crews cannot attend the combined arms rehearsal. Having attack helicopter crews staggering their duty cycle allows for all attack pilots to participate in the combined arms rehearsal. Experience proves that participation in the combined arms rehearsal ensures that the commander's intent is clearly understood by all prior to execution. Another benefit of conducting a combined arms rehearsal is practicing target handovers. Coordinating target handovers is highly important in order to expedite engagements. Once the battle begins, air-ground integration is a highly detailed process. If crewmembers have the opportunity to practice target handovers in a non-threatening environment, the probability of conducting successful target handovers in a combat environment is highly increased.

According to aviation doctrine, just as important as having the attack helicopters assigned to an area is also having the capability to sustain them on station. Research and analysis from 11th Attack Helicopter Regiment suggest "the key element to success of

Apaches in the close combat role is the Forward Area Refueling Point (FARP).” The FARP is the center of gravity to attack helicopters supporting the ground maneuver commander in the close combat role. Its purpose is to provide continuous fuel and ammunition to the attack helicopters. A FARP is capable of refueling and rearming multiple helicopters simultaneously. However, the enemy also realizes the FARP is a target and not easy to hide. Therefore, the enemy will exploit all means available to destroy it. FARPs must be located safely away from the engagement and have a solid force protection plan. Having a FARP located too far from the engagement reduces the station time of the helicopters. A FARP located too close to the engagement creates the possibility of attack by the enemy because it is a soft target. FARPS are also highly susceptible to indirect artillery fires due to the amounts of fuel and other explosives. Therefore, the enemy can disrupt refueling and rearming operations in a multitude of ways. Commanders must ensure that all force protection measures are considered when planning for a FARP.

Whereas force protection is important to the FARP, it is also just as important to the attack helicopter crews. Experience proves that allowing attack helicopters to be flexible also enhances their force protection or survivability. Analysis from 1st Battalion 3rd Aviation Regiment in OIF shows that “operating in the close combat support role allows attack helicopters to be more flexible than in deep attack operations.” When attack helicopters move along a flight path for a deep attack operation, they have little flexibility and maneuverability. Deep attack operations must be synchronized with all combat systems, and this usually creates nonflexible flight routes. During deep attack operations, synchronization involves many combat systems. In order to stay synchronized on the

flight path, attack pilots cannot use the terrain to maneuver. However, operating in pairs and not being restricted to a certain flight route increases the survivability of attack helicopters. As they operate together, attack helicopters reduce their exposure time to the enemy by performing survivability enhancing maneuvers. An example of survivability enhancing maneuvers is “bounding over watch.” It is recommended for attack and reconnaissance helicopters, when enemy contact is expected. Bounding over watch is also the preferred technique, while conducting air-ground integration operations. Performing bounding over watch enables one helicopter to get set prior to the other one moving. Once a helicopter starts to maneuver, the stationary helicopter has the role of providing over watch and suppressive fires. Therefore, properly performing bounding over watch highly increases the survivability of the attack helicopter crews.

Finally, research from 3rd Battalion 101st Aviation Regiment AAR proves that “attack helicopter crews performing the close combat role must coordinate directly with the ground elements that they are supporting in order to help prevent fratricide. Additionally, this report also signifies coordination is properly accomplished when conducted prior to a mission execution.” Pilots normally link up with their ground maneuver counterparts either at a commander’s update or a combined arms rehearsal. During the update or rehearsal, mission essential information is exchanged and synchronized. This is vital to the success of air-ground integration and to reduce the possibility of engaging a friendly vehicle. During the combined arms rehearsal, crewmembers have the benefit of visually locating friendly area locations prior to departure. The AAR from 3rd Battalion 101st Aviation Regiment also proves in OIF that “crews attending the combined arms rehearsal clearly knew the location of friendly units,

which expedited the time for clearance of indirect fires." Clearing friendly elements of indirect fires is vital in fratricide prevention. The combined arms rehearsal also provides the crewmembers the time and place to fully understand their mission. They have the opportunity to put a face with a voice. Placing a face with a voice will help crewmembers understand the urgency of a situation during enemy contact. Experience proves there is no substitute for properly conducting a combined arms rehearsal.

Kiowa Warriors in Urban Operations

Kiowa Warrior helicopters proved their relevance in urban operations during OIF through the following examples. By having the capability to "fly with the doors off the helicopter allowed the crews to better acquire and engage the enemy in built up areas" (Hawley 2002, 03). Once contact was made, the Kiowa Warrior crew would either "engage with a direct fire weapon or acquire cover and call for indirect fires" (Hawley 2002, 03). The Kiowa Warrior provided the ground maneuver commander an additional eye by coordinating directly with the friendly ground elements in combat. Even though analysis from 2nd Squadron 17th Cavalry Regiment in OIF suggested that the "MMS does not provide a substantial advantage in urban combat" (Hawley 2002, 03), the need still exist for the aerial scout. With the latest night vision goggles, Kiowa Warrior crews could maneuver and provide continuous support to the ground maneuver commander. With the capability to look underneath the goggles, Kiowa Warrior crews can instantly see differently lighted enemy elements. Analysis from 2nd Squadron 17th Cavalry Regiment's AAR also shows Kiowa Warriors operating in urban combat can quickly pass spot reports and enemy targets to the friendly ground element in contact. When contact is made by the friendly ground element, "the Kiowa Warrior crew transitions from an

acquisition mode to a fire support mode" (Hawley 2002, 03). Even though direct fire support from the Kiowa Warrior is minimal due to the limited capability to carry multiple weapons, the helicopter more than validated its place in urban combat. The Kiowa Warrior helicopter has the capability to support the ground maneuver commander in urban combat with hellfire engagements and aerial rockets. Aerial rockets armed with flechette rounds are especially effective in urban combat. Flechette rockets are armed with approximately one thousand nails exploding in the air. The AAR from 2/6 Cavalry 11th Aviation Regiment provides evidence that "flechette rounds are highly effective in destroying enemy troops and lightly skinned vehicles." Prior to operations in OIF and OEF, they were taken out of the Army's inventory. However, the requirement for them resurfaced in urban combat operations.

Another way the Kiowa Warrior validated its purpose in urban combat operations was conducting security patrols with convoys. The enemy's use of asymmetrical warfare, including setting off improvised explosive devices (IEDs), created an immediate need for aerial reconnaissance. Kiowa Warrior helicopters quickly demonstrated their ability to help conduct reconnaissance and security missions for the ground maneuver commander. Units equipped with Kiowa Warriors developed TTPs for combat security missions. By maneuvering over and ahead of the convoy, the Kiowa Warrior crews have the ability to identify possible IEDs and ambush sites. "Once enemy contact was made, Kiowa Warriors would maneuver, engage, and destroy the threat. While Kiowa Warriors destroyed the enemy, the convoy quickly bypassed the ambush area" (Hawley 2002, 02). While supporting the convoy, the Kiowa Warrior crews possess the capability to provide quick and effective mobile fire support against enemy targets. Flying and maneuvering

around hills and curves in the road reduces the enemy's advantage. This TTP also creates an advantage for Kiowa Warrior crews. The crewmembers have access to an immediate down aircrew recovery plan due to close location of the supported ground convoy. Additionally, as IEDs quickly became a serious problem for the convoys after May 2003, Kiowa Warriors were used to conduct counter reconnaissance. Their task was to locate and destroy enemy elements as they attempted to emplace an IED. "The enemy's current TTP for IEDs is to emplace them at night" (IED task force lecture). Under the coverage of darkness, the enemy has the opportunity to quickly emplace an IED along roads used by friendly ground vehicles. The superior night seeing capability of the Kiowa Warrior was highly effective in reducing the numbers of emplaced IEDs. The ground maneuver commander would employ his Kiowa Warrior crews in IED areas of concern. Operating in pairs, they could perform aerial reconnaissance of roads, bridges, choke points, etc. in possible locations of IEDs. Once the helicopter crew identified insurgents emplacing an IED, they had the authority to either destroy them with direct or indirect fires. Kiowa Warrior pilots calling for indirect fires are highly effective and were most often used. This prevented the crews from exposing their location. Currently, AARs show a decrease in the amount of IEDs in the areas that Kiowa Warriors were conducting armed reconnaissance for IEDs.

Even though the Kiowa Warrior proved to be highly effective in urban combat operations, the crews had to create new TTPs. One TTP that Kiowa Warrior crews had to implement was to continuous maneuver instead of hovering in urban combat. With numerous buildings and hide points in urban combat, helicopter crews are in constant danger. By continuously maneuvering using various different speeds, the enemy is less

likely to emplace effective fires against the helicopters. Prior to OIF and OEF, attack and reconnaissance pilots were trained on hovering during engagements. The 2nd Squadron 17th Cavalry Regiment AAR provided proof "from combat accurately reported that maneuvering helicopters are less likely to be shot down" (Hawley 2002, 02). Another TTP that had to be created for Kiowa Warrior helicopters operating in urban combat was "target handovers from ground elements to the aircrews" (Hawley 2002, 02). Since ground elements see the terrain and the enemy differently than the aircrews, TTPs had to be developed for passing situational reports. Soldiers in urban combat would conduct a target handover to a Kiowa Warrior crew by "identifying enemy targets at a stop sign" (Hawley 2002, 02). With no way of identifying a particular stop sign, TTPs were quickly developed and taught to soldiers working with Kiowa Warrior helicopters. A TTP developed for handling numerous situational reports in a fluid urban battlefield was the "implementation of an enlisted tactical air controller (ETAC). The ETAC would gather and pass situational reports over to the aircrews so that they could engage the enemy" (Hawley 2002, 04). The ETAC is responsible for communicating and filtering the information from the ground element prior to sending it to the aircrews. This helps prevent the helicopter crews from having to decipher enemy information, while performing other aviation tasks. This TTP proved especially helpful to the crews operating at night.

Kiowa Warriors Maneuvering with Longbow Apaches

Even though Kiowa Warriors and Longbow Apaches rarely operate together, personal experiences from training missions conducted at the Army's National Training Center provide positive results when they do. With the technological capabilities of these

two helicopters, multiple missions can be accomplished. A mission involving one or two Kiowa Warriors and one or two Apaches or Apache Longbows provides increased lethality. They have the ability, when working together, to provide additional mobile fire support to the ground maneuver commander. TTPs proven effective are for the scout helicopter to conduct air-ground integration with the ground element in contact, while the attack crew engages and destroys targets. The attack helicopter can occupy an ATTACK-BY-FIRE POSITION and launch missiles destroying enemy targets, while the scout crew designates for the remote hellfire operation. Conducting remote hellfire operations provides additional fire support to the ground element and helps reduce fratricide. By communicating directly with the ground element in contact, the scout crew can quickly locate and identify friendly elements. As the friendly elements are passed over a secure radio, the likelihood of a fratricide occurring is greatly reduced. Also, enemy targets can be quickly identified and destroyed prior to the ground element becoming decisively engaged. The added benefit of an attack helicopter carrying up to sixteen hellfire missiles provides a ground company commander overwhelming firepower. Additionally, since the two helicopters have different night seeing capabilities, they can acquire multiple types of targets at night. Basically, the Apache crews can concentrate on engaging and destroying the enemy, while the scout crews conduct security and air-integration tasks. Another added benefit of this TTP is reducing the amount of tasks in the individual cockpits. These highly technological helicopters operating at night can almost become unsafe with increased cockpit tasks as mentioned previously. By maneuvering Kiowa Warriors and Apaches together in an air-ground integration role, they can reduce their cockpit tasks. This TTP also increases the speed of target handovers, which may save friendly lives in

combat. Additionally, maneuvering and communicating together reduces the safety risk factor for the crews. As previously stated, analysis proves that rehearsing and conducting back briefs prior to an operation ensures attack and scout crews know exactly their task during the engagement. They will also know which friendly ground element they are supporting including the type of vehicles. During the operation, they can maneuver and support each other, while providing overwhelming mobile fire support to the friendly ground maneuver element.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Analyzing Army Aviation's employment of attack and reconnaissance helicopters in the contemporary operating environment has produced numerous lessons learned. Attack and reconnaissance pilots must have these lessons learned incorporated into their training. Even though correcting the lessons learned from combat will require additional funding and training, they are essential for Army Aviation's success in attack and reconnaissance operations. Only by highlighting the areas of concern and implementing the changes will permit Army Aviation to maintain its advantage on future battlefields. Additionally, many of these lessons learned from OIF and OEF have also been included in AARs. The conclusion of this thesis will provide recommendations into the areas of concern for Army Aviation's attack and reconnaissance operations. Lessons learned from the contemporary operating environment and AARs from combat missions suggest additional emphasis on individual training, crew training, team and platoon training, joint training, and gunnery. If senior leaders within Army Aviation plan on attack and reconnaissance helicopters continuing to be a force multiplier for future ground maneuver commanders then training at the individual, crew, team, joint, and gunnery must be addressed and corrected.

Individual Training

The basics for all attack and reconnaissance pilot training start at the individual level. One of the tasks that new pilots graduating from the Kiowa Warrior course, Apache Course, or the Apache Longbow course must have additional training is digital

communications. As the Army moves more toward digital communications, all attack and reconnaissance pilots must be able to fully receive and transfer digital messages. The aviation report from 1st Battalion 3rd Aviation Regiment identifies numerous problems with “aviators communicating digitally” (Rude 2003, 04). Prior to pilots graduating from flight school, they must be fully trained in digital communication. Additionally, they must receive periodic training at their home station in transferring and receiving digital messages. Only by training with other combat units in digital communications will attack and reconnaissance pilots stay proficient.

Another task that attack and reconnaissance pilots need additional training at the individual level is maneuvering the helicopter. After years of training attack and reconnaissance pilots to acquire and engage enemy vehicles at a hover, results from OIF and OEF proved that pilots must conduct these tasks while maneuvering the helicopter. On today’s modern battlefield, filled with multiple asymmetrical threats, attack and reconnaissance pilots will better survive if they continuously maneuver the helicopter. Pilots must receive this initial training in flight school and be proficient prior to graduating. Additionally, after pilots arrive in the unit they should receive periodic flight evaluations. During the flight evaluations, attack and reconnaissance pilots must demonstrate proficiency, while maneuvering the helicopter, in all assigned tasks. Pilots must know how to maneuver the helicopter using various speeds and altitudes. By varying the speed and the altitude of the helicopter, pilots decrease their exposure time to the enemy. All pilots must also be evaluated on maneuvering the helicopter while reacting to hostile fire, acquiring enemy targets, and operating the weapon systems. An instructor pilot must certify each individual pilot on all the above-mentioned tasks.

Individual pilots can begin their mission training once they are certified at the unit level. Even though this additional training and certification will increase the aviation budget, the benefits will greatly outweigh the cost. The costs of not conducting this additional training could be associated with an increase in casualties and in damages to helicopters.

The last task that individual pilots must be proficient is the use of night vision goggles. Even though scout pilots are mostly proficient on night vision goggles, attack pilots are not. Urban combat operations prove that attack pilots need the night vision goggles in the front seat. Even though attack pilots are trained at flying and locating enemy targets through the FLIR system, the material assessment debriefing for 2/6 Cavalry 11th Aviation Regiment recommends, "that Apache pilots in the front seat need the additional capability of night vision goggles." If the pilot in the front seat of an Apache has the capability to use night vision goggles, target handovers with the ground maneuver elements are much easier to conduct because they are both seeing the same silhouettes. Night vision goggles also have the capability to identify other helicopters easier. If they are working in the same battle space as Kiowa Warrior helicopters, the night vision goggles enhance the pilot's ability in the front seat to locate and avoid a possible midair collision. Additionally, the FLIR in the front does not turn at the same speed as the pilot's head. A delay of 1 to 1.5 seconds is highly noticeable, when pilots are conducting target handovers and maneuvering in an urban environment. Night vision goggles are needed in the front seat of an Apache because they are connected to the pilot's helmet. By being connected to the helmet, they move and acquire targets simultaneous with the pilot's vision. The FLIR in the front seat of the Apache is connected to the nose of the aircraft. Therefore, it does not have the capability to turn as

fast as the front seat pilot's helmet. Finally, night vision goggles are needed in the front seat of an Apache because they have better night visual acuity than the FLIR. From experience, even under the darkest of conditions, the night vision system in the front seat of an Apache is not as clear as night vision goggles.

Crew Training

After an individual pilot is certified in all base tasks, he or she must be crewed with another trained pilot in order to create a lethal attack or reconnaissance crew. Lethal crews know how to employ their aircraft and their weapon systems prior to arriving in a combat zone. In order for an attack or reconnaissance helicopter crews to be more lethal in the future, they must be given enough time to fly and train together. Training together helps the crews develop positive habits, such as transferring the flight controls. Even though transferring the flight controls is a basic task, it should not be taken for granted. Maneuvering under enemy fire will create additional confusion in the cockpit. Providing additional training time to the crews can help reduce the confusion of maneuvering under enemy fire. Currently, each attack and reconnaissance pilot must fly at a minimum of seventy hours every six months. Experience proves that crews flying more than seventy hours every six months are more lethal in combat. However, additional training time does not come without an increase in aviation budgets. Therefore, decisions by senior aviation commanders must be made as to what is the most important outcome, saving money in the budget or saving lives.

Additionally, flying and training together will also create more crews who know how to better support the ground maneuver commander. One of the most important ways of supporting the ground maneuver commander in combat is air-ground integration.

Attack and reconnaissance helicopter crews must know how to fully conduct air-ground integration in the future. The AAR of OIF operations by the 1st Battalion, 3rd Aviation Regiment concludes, “that air-ground integration and close combat attack are critical tasks that all crews must be proficient in the future” (Rude 2003, 04). Having crews trained in air-ground integration and close combat attack missions provides the ground maneuver commander multiple elements of mobile fire support. Crews proficient in air-ground integration and close combat support will help save friendly lives in battle. Trained attack and reconnaissance helicopter crews have their internal TTPs developed to acquire and engage enemy targets. Being able to acquire and pass enemy targets quickly is one way of saving lives. Therefore, it is essential to the ground maneuver commanders that attack and reconnaissance helicopter crews know how to acquire and conduct targets handovers quickly.

Finally, another key benefit of crews training together is arranging their individual cockpits in order to reduce engagement times. Since the enemy is trying to implement death and destruction, attack and reconnaissance crews must be quick and precise at engaging targets. Arriving in theater is too late to begin internal cockpit training. Crews must concentrate and focus on engaging the enemy quickly to reduce the probability of being shot down. TTPs must be identified and trained at the unit level to reduce engagement times. Setting up the cockpit to engage enemy targets quickly will help increase the lethality of the crew. Crews, who are knowledgeable and train together, can reduce some of the steps for a weapons engagement. Expediting quickly can possibly prevent a loss of life or death of the attack or reconnaissance helicopter crew. Also, crews can reduce their amount of internal communication if they train together. Reducing

internal communication allows the pilots to monitor more radios simultaneously. Since a cockpit can have up four radios communicating during a battle, there is little room for crews to communicate internally, while maintaining their situational awareness. Attack and reconnaissance helicopter crews will increase their overall battlefield situational awareness if they can perform, while reducing their internal communication. If a crew relies on excessive cockpit communication, they will not be as lethal. Combat ready crews are those who can acquire, engage, and destroy enemy targets without excessive cockpit communication. Additionally, reducing internal communication also allows for each crewmember to communicate on a separate radio, while performing their mission. An example could be that one crewmember controls the indirect fire net, while the other crewmember controls the close air support net.

Team and Platoon Training

Aviation units returning from combat are increasing their training focus on team and platoon training at home station. Senior aviation commanders have realized that the days are gone for multiple attack and reconnaissance helicopters to concentrate only on one mission. The future for Army Aviation is two and three helicopters focusing on either an air-ground integration or close combat attack mission. Even though aviation brigade and battalion commanders will retain their ability for helicopter employment, platoon leaders must learn how to command and control their assets. Therefore, more emphasis will be placed in the future on conducting aviation missions at the team or platoon level. Aviation lieutenants must receive initial training during the basic course on multiple missions of their assigned aircraft. Attack and reconnaissance lieutenants must learn how to plan and work as a member of the combined arms team in the aviation basic course. By

receiving doctrinal training in the officer basic course, aviation lieutenants will have the knowledge base for developing effective TTPs in their unit. Prior to leaving the aviation basic course, aviation lieutenants must understand the doctrinal concepts of indirect fires, close air support, air-ground integration, and close combat attack.

Upon arrival at their unit, aviation lieutenants should be ready for mission training. They will likely have the opportunity to increase their skills during multiple exercises including aerial gunneries, platoon lanes, and missions at the Army's training centers. Also, as a result of more decentralized training, attack, and reconnaissance platoons will become more lethal. Aviation platoon leaders will learn how to plan, brief, and rehearse combined arms missions. After completing this training they will be an effective leader within the combined arms community. By focusing training at the team or platoon level, senior aviation commanders can feel comfortable that their intent will be understood in combat.

Another important benefit of training junior aviation officers is maximizing the crew rest policy. Maximizing the Army's crew rest policy increases the probability of launching multiple helicopters throughout a twenty-four hour period. Senior aviators at all levels returning from Iraq jointly agree the "current crew rest policy works" (Rude 2003, 02). The current crew rest policy authorizes pilots to fly no more than eight hours of day conditions, no more than five hours of night conditions, and a maximum of six hours of day and night combined. Additionally, during a twenty-four period the current crew rest policy provides for each pilot to receive at a minimum of eight hours of rest each night, which has been proven to be essential in reducing aviation accidents. Since aviation missions are continuously conducted under all types of environmental

challenges, attack and reconnaissance pilots need their crew rest. Therefore, an aviation lieutenant must possess the knowledge to employ his team, which usually consist of three aircraft. If a battalion commander has competent platoon leaders and troop commanders, he can provide continuous twenty-four hour helicopter coverage to a ground maneuver brigade commander. If an aviation battalion commander has the capability to provide close combat support in teams of three Apaches, the ground-maneuver brigade commander will always have attack helicopters on station. Adhering to the Army's current crew rest policy, pilots are allowed to fly combat or training missions daily. The overall result is pilots developing battle rhythms to support the ground maneuver commander without becoming exhausted and possibly unsafe.

Joint Training

The most repeated aviation OIF or OEF AAR comment from 1st battalion, 3rd Aviation Regiment, and 2/6 Cavalry, 11th Aviation Regiment, is, "the need for more joint training exercises." Since the military is normally operating in a joint force and conducting joint combat missions, the need exist for more joint training. Joint training exercises provide the opportunity for the military services to grow together. If the United States military continues to wait for units arriving in a combat theater before they work together then the lessons learned from OIF and OEF will possibly have to be relearned. Working and growing together prior to arriving in a combat theater sets the foundation for success in combat. Therefore, joint training exercises in the future must be conducted under all types of environmental conditions and at every possible training opportunity. An excellent place to conduct joint training exercises is at the Army's training centers. Simulation exercises do not address all the possible environmental effects and conditions.

Even though planning and briefing joint missions can adequately prepared a simulation exercise, the other adverse effects of combat cannot. An operator participating in a joint war-fighter exercise in an air-conditioned room will not feel the same effects as an operator, who is operating in 125-degree temperatures.

Another benefit of conducting joint training exercises is for the operators to learn the capabilities and limitations of the other services. Since each component of the United States military has different strengths and weaknesses, joint training exercises are an excellent way for the service members to learn. The lack of knowledge occurs from combat systems to intelligence systems. One of the most noticeable lessons learned about combat systems in OIF and OEF was the capability of joint firepower and its benefit to attack and reconnaissance helicopter operations. The primary way that joint firepower supports attack and reconnaissance helicopter operations is through SEAD. Even though SEAD missions can be conducted using different types of assets, joint firepower creates additional effects. Army attack and reconnaissance pilots must learn the capability of the Air Force providing their SEAD. The Air Force has the capability to provide increased SEAD effects by attacking the enemy targets from the air. Overall, the shift toward a more joint force is welcomed due to the services supporting the other's weaknesses. Finally, communicating together, which includes understanding all capabilities and limitations, creates more desirable lethal effects for the ground maneuver commander.

Not only does joint training enhance the understanding of the other services, but it also teaches attack and reconnaissance pilots how to implement joint force capabilities. Experiences prove that most attack and reconnaissance pilots do not know how to adequately talk a close air support asset onto an enemy target. Since some of the

acronyms are different between the services, many attack and reconnaissance pilots have difficulty in communicating with Air Force pilots. Therefore, joint training conducted at the Army's training centers can help create combat training scenarios for Kiowa Warrior and Apache pilots to train with Air Force pilots. Attack and reconnaissance pilots can practice communicating directly with Air Force pilots by identifying enemy targets and calling for close air support. Also, during joint training exercises, attack and reconnaissance pilots can practice learning how to read and understand all the intelligence capabilities of other services. Every branch of military service has unique capabilities that can aid attack and reconnaissance helicopter pilots. One such intelligence system is the Joint Surveillance Tracking Attack System (JSTARS). JSTARS is an Air Force asset that can detect enemy targets and transfer their locations to Apache Longbow pilots. From the author's perspective, many Apache Longbow pilots do not know how to adequately incorporate JSTARS in their planning and execution. Therefore, future joint training needs to also include JSTARS with attack helicopter operations so the link can be learned prior to combat operations.

Army Transformation Requirements for Aviation

As the Army continues to transform, one significant change for aviation is the creation of the Brigade Aviation Element (BAE). Training Circular 1-400 addresses, "the roles and responsibilities of the BAE." The BAE is a deliberate effort to place full time aviation officers within the Brigade Combat Team (BCT). The purpose of the BAE is to conduct "close coordination with the BCT S-3, commander, and the BCT Staff." The BAE is capable of conducting twenty-four operations and consists of: one aviation major, captain, one chief warrant officer four who is a tactical operations officer, one aviation

operations sergeant, and two aviation operations specialists The BAE is also capable of integrating in joint planning and communications, while being incorporated in the BCT from the receipt of the warning order through all phases of the BCT's mission Having competent aviation officers and soldiers permanently assigned to the BCT will provide the knowledge and experience necessary to conduct successful combined arms operations. In today's contemporary operating environment, the BAE will also help coordinate the aviation support needed to combat the multiple asymmetrical threats.

Gunnery

Of all the attack and reconnaissance helicopter lessons learned from OIF and OEF, issues with weapon system employment brought the greatest concern. Aviators returning from combat overall claim that "gunnery needs to be overhauled and become more realistic." Major changes must be incorporated into the helicopter gunnery program in the future. Gunnery scenarios and training must include actual weapon system employments that occur in combat. All helicopter gunnery ranges must have running fire lanes and omit the hover fire lanes. Upon qualifying on the helicopter gunnery range, attack and reconnaissance pilots must have the opportunity to conduct combined arms ranges with armored, and infantry units. Only by training together will all service members understand the capabilities and limitations of combat systems. Combined arm ranges must also be fast paced and incorporated with close air support. Indirect fires must be planned, rehearsed, and adjusted, while all member of the combined arms team are maneuvering on the range. Combined arms ranges must also include supporting the ground maneuver commander with close combat attack operations. If gunnery ranges are not realistic and similar to the operational environment that exists on the battlefield then

the combined arms fight is not as effective in combat. Senior Army Commanders who cannot understand the validity of fast pace gunnery operations should rethink the pace of combat. Combat experiences prove that survivability on the battlefield results from delivering lethal munitions on the enemy prior to being engaged. Additionally, senior Army Commanders must take prudent risks during fast paced gunnery exercises, but the benefit of conducting realistic training far exceeds the safety risk.

Another recent gunnery lessoned learned from OIF and OEF was weapon load munitions and their effects on the enemy. The Science and Technology Assessment Team report on 2/6 Cavalry, 11th Aviation Regiment, concluded, “Flechette rounds must be incorporated into the gunnery scenarios.” Prior to the start of OIF and OEF, flechette rounds were not included in the helicopter gunnery program. However, they were brought into theater to be used against the insurgents. Once flechette rounds arrived in country, few attack and reconnaissance pilots knew how to deliver them. Even though flechette rounds had to be incorporated in the helicopter’s basic armament load upon their arrival, they were not immediately effective against the enemy due to the lack of knowledge. The assessment team reported, “as a result of attack and reconnaissance pilots not knowing how to employ them, valuable time elapsed before they were used.” Additionally, the other weapon load noted in The Science and Technology Assessment Team report on 2/6 Cavalry, 11th Aviation Regiment, was “the K model Hellfire Missile.” They concluded that it “hit an overwhelming majority of its targets due to its lower trajectory.” Since the K model missile has a lower trajectory, it is not as likely to loose its laser source due to atmosphere obscurants. Lessons learned from combat suggest, “helicopter gunnery programs must include Flechette rounds and the K model Hellfire Missile into their

training." By incorporating these munitions, attack and reconnaissance pilots will have a reduced training time in theater prior to combat operations beginning.

In summary, realistic home-station training at the individual, crew, team, joint, and gunnery is the key to success for attack and reconnaissance aviators employing in a contemporary operating environment. Kiowa Warrior, Apache, and Apache Longbow pilots must continue training and integrating with the ground maneuver elements to include air-ground integration and close combat attack. Since attack and reconnaissance helicopters increase a ground maneuver commander's mobile fire support, combined arms commanders at all levels must also be proficient in employing these assets in a contemporary operating environment. Even though the possibility still remains for Apache and Apache Longbow helicopters to conduct deep attack operations, these missions must be understood as high risk. Other assets must be identified and employed prior to planning a deep attack helicopter operation. Deep attack training at the company level should remain on the mission essential task list. However, it must not be the only type of task that attack pilots perform.

GLOSSARY

Asymmetry. Dissimilarities in organization, equipment, doctrine, capabilities, and values between other armed forces (formally organized or not) and US forces. Engagements are symmetric if forces, technologies, and weapons are similar; they are asymmetric if forces, technologies, and weapons are different, or if a resort to terrorism and rejection of more conventional rules of engagement are the norm (FM 3-0).

Contemporary Operating Environment. The overall operational environment that exits today and in the future (out to the year 2020). The range of threats during this period extends from smaller, lower technology using more adaptive, asymmetric methods to larger, modernized forces able to engage deployed U.S. Forces in conventional, symmetrical ways. In some possible conflicts (or in multiple, concurrent conflicts), a combination of the types of threats could be especially problematic (www.strategypage.com/articles/operationenduringfreedom/chap1.asp).

Linear Operations. Maneuver units normally operate in contiguous AOs. Each combined arms force directs and sustains combat power toward enemy forces in concert with adjacent units (FM 3-0).

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